This lesson delves into the world of metrics, mathematically speaking. It's intended to introduce and explore grams (g) and kilograms (kg), plus its uses and real world applications.

**Learning Objectives**

After finishing the lesson, the students will be able to measure and estimate masses of objects using standard units of grams and kilograms.

**Materials and Preparation**

- Balance scales
- Gram weights or large paper clips
- Penny
- Kilogram weight or a box of 1,000 large paper clips
- Small paperback book
- Pencils
- Lined paper

**Key Terms:**

- standard unit
- balance scale
- grams (g)
- kilograms (kg)
- estimate
- mass

**Lesson**

**Introduction (10 minutes)**

- Explain to the class that a **gram** is a metric unit of measurement that you can use to measure the **mass**, or weight, of an object.
- List some things that are usually measured in grams. Great examples are baking ingredients like sugar and flour.
- Ask students to share any times they've noticed the weight of an object recorded in grams.
Explicit Instruction/Teacher Modeling (10 minutes)

- Show the class a balance scale, and let them know that this type of scale is used to measure the mass of small items.
- Write "grams (g)" and "kilograms (kg)" on the board. Explain that these will be the units of measurement involved in the upcoming activity. One gram weighs about as much as one large paper clip, and one kilogram (which is equal to 1,000 grams and roughly equal to 2.2 pounds) weighs about as much as 1,000 large paper clips.

Guided Practice/Interactive Modeling (20 minutes)

- Place the gram weight or paper clip onto one of the pans.
- Ask a student to locate a classroom item that she believes weighs more than one gram. Have her place the item onto the other pan.
- Explain that the heavier item will make its pan drop lower. Record how heavy the student's item is relative to one gram (less than, equal to, or more than) on the board. (This will be the first entry in a list of records, so make sure to leave plenty of space below it.)
- Replace the student's item with a penny and record the results.
- Pause for a few minutes to have a class discussion about the results thus far.
- Replace the gram weight with the kilogram weight.
- Ask a different student to locate an item that seems heavier than one kilogram. Have her replace the penny with it, then record the results.

Independent Working Time (50 minutes)

- Organize students into groups of three or four.
- Have each group decide on roles for its members: 1-2 students will locate 4 items that they believe weigh about one gram; one student will use a scale to compare the items to a gram weight; one student will record the results of each comparison.
- Before starting the exercise, distribute a scale, gram weight, pencil, and piece of lined paper to each group. Have each record-keeper make a three-columned chart labeled "Less Than," "Equal To," and "More Than" on the sheet of paper. Each item the group examines will be placed into one of the columns based on its weight. For example, a marker would go into the "more than" column because it weighs more than one gram.
- Give students 10 minutes to find, weigh, and record the comparison results for each item.
Extend

Differentiation

- **Enrichment**: Have advanced groups make "Actual Weight" charts on the back of their sheets. They can also find and record the weights of their items by comparing them to multiple gram weights.
- **Support**: Work with struggling students to guide them towards items you believe will result in a measurement of one gram.

Related Books and/or Media

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Review

**Assessment** *(10 minutes)*

- Monitor students over the course of the exercise.
- Collect the charts once students are done working and review them later to assess your students' comprehension of the topic.

**Review and Closing** *(10 minutes)*

- Have students regroup.
- Review the definitions of gram and kilogram.
- Allow students to ask questions and give comments about the lesson.